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AN OUTBREAK OF TOXIN A NEGATIVE, TOXIN B POSITIVE *CLOSTRIDIUM DIFFICILE*-ASSOCIATED DIARRHEA IN A CANADIAN TERTIARY-CARE HOSPITAL

Introduction

Toxigenic *Clostridium difficile* is a frequent cause of infectious nosocomial diarrhea accounting for up to 25% of nosocomial diarrhea cases⁽¹⁾. Clinically significant disease is thought to be due almost exclusively to *C. difficile* strains that produce both toxin A and toxin B. Toxigenic *C. difficile* produces a broad spectrum of gastrointestinal disease varying from asymptomatic carriage to fulminant pseudomembranous colitis (PMC). Relapses after therapy occur in 7% to 20% of cases^(2,3). Predisposing conditions and the use of broad spectrum antimicrobials in a susceptible patient population makes *C. difficile* disease increasingly common in acute-care centres.

The organism can be detected by culture and subsequent toxin testing of the isolate, but this cumbersome and slow method is seldom used routinely. Direct toxin detection in the stool can be accomplished by enzyme-linked immunoassays (EIAs); however, the gold standard diagnostic test remains the tissue culture cytotoxicity assay. Available EIAs can detect toxin A alone, or both toxins A and B. These assays provide results in hours compared to the 1 to 2 days required for completion of the tissue culture cytotoxicity assay. EIAs are less sensitive (70% to 90%) than the cytotoxicity assay but demonstrate excellent specificity (99%)⁽⁴⁾. In equivocal cases, the diagnosis may be established by detecting PMC through direct visualization with sigmoidoscopy or colonoscopy^(4,5), depending on the clinical scenario.

Infection with *C. difficile* increases morbidity and mortality among hospitalized patients leading to more investigation, therapeutic interventions, and increased length of stay, all which

lead to increased cost of care^(3,6-8). The following is a report of an outbreak of *C. difficile*-associated diarrhea (CDAD) that was caused by a toxin A negative (-), toxin B positive (+) strain of *C. difficile*.

Description of Outbreak

Between 29 June and 30 September 1998, 16 cases of nosocomial diarrhea caused by a unique strain of *C. difficile* were identified at the Health Sciences Centre, a 789-bed tertiary-care university teaching hospital in Winnipeg, Manitoba. A case was defined as anyone who was hospitalized for ≥ 48 hours and developed diarrhea, and whose stool was negative by an EIA that detected only toxin A (*Prima System*™ EIA, Bartels Inc.).

The cases were located on four wards; Wards 1, 2, and 4 were general medical wards, and Ward 3 was an oncology ward. The average age of the cases involved in the outbreak was 57.56 ± 23.29 years; 50% of the cases were female. Four cases had an underlying neoplasm (25%) and seven (43.7%) had renal failure; six (33.3%) of the seven were dialysis dependent. Eight (50%) had been admitted to Ward 1 at some point during their hospitalization.

A leukemic patient, with antibiotic-associated diarrhea, who tested negative for *C. difficile* by an EIA for toxin A on three separate occasions was presumed to be the index case. Due to a high clinical suspicion of CDAD, this case underwent colonoscopy confirming a diagnosis of PMC. Given this presentation, concern was raised that a unique strain of *C. difficile* may be causing this clinical syndrome. Therefore, a stool specimen was evaluated and



found to be positive for *C. difficile* toxin, using the tissue culture cytotoxicity assay capable of detecting both toxins A and B.

Over the next 2 weeks, on the same ward as the index case (Ward 1), three additional cases had similar presentation with the EIA for toxin A being negative, yet all were positive by tissue culture cytotoxicity assay. By the end of the third week of the outbreak, nine similar cases were confirmed. Two of these cases died due to uncontrolled sepsis and multiple organ failure. Two other cases had spontaneous resolution of their diarrhea without relapse, despite not receiving antibiotic therapy for their CDAD. By the fourth week, stool specimens submitted for *C. difficile* toxin testing were evaluated using an EIA capable of detecting both toxins A and B (*TOX A/B TEST*, TechLab). Seven cases were identified as negative for only toxin A by the EIA for toxin A, but were positive by the EIA for both toxins A and B. All cases had received at least one antimicrobial agent (range: 1 to 8) in the month prior to the onset of symptoms. Among the 16 cases with CDAD, three (18.75%) had a clinical relapse. These data indicate that this outbreak was due to a strain of *C. difficile* which was toxin A (-), yet toxin B (+). Environmental cultures did not yield *C. difficile*. Further genetic analysis of the isolates is currently in progress to clarify what portion of the toxin A gene is missing.

Intervention

Following the identification of the first cases caused by this unusual strain of *C. difficile*, an investigation was undertaken which identified that 50% of the cases arose from Ward 1. Existing infection-control practices were reviewed and modifications instituted. The infection control measures undertaken during this outbreak included educating health-care workers and families of patients, and all head nurses. A hospital newsletter focusing on *C. difficile* was distributed. Infection-control precautions for suspected or confirmed cases of *C. difficile* diarrhea included cohorting of cases, single rooms for cases with poor hygiene, gowning and gloving if contamination was likely; precautions were discontinued 48 hours after the last diarrheal stool. Intensified housekeeping measures consisted of changing the pull cords of call bells from string to metal, increasing the availability of hospital-approved disinfectant, and increasing the frequency of cleaning in patient-care areas, specifically rooms, mobile commode chairs, and washrooms. Hand hygiene was promoted by reviewing and reinforcing hand washing practices, and encouraging the use of alcohol-based hand disinfecting solutions. Laboratory-related measures included the prompt collection and analysis of diarrheal stools for the presence of *C. difficile* toxin using the tissue culture cytotoxic assay for toxins A and B.

Discussion

This is believed to be the first outbreak of toxin A (-), toxin B (+) *C. difficile*-associated disease. The exact duration of this outbreak is unknown; it was not until this cluster was noticed that the problem was identified. A 12-month retrospective review of the number of specimens positive for *C. difficile* toxin did not reveal any gross variation in the trend. It was not until 5 August

1998 that changes were made to the *C. difficile* toxin-testing technique leading to the identification of the toxin A (-), toxin B (+) strain. It is also unclear whether this strain arose independently in the institution where the outbreak occurred or whether it was introduced to this institution from another source.

One case (Case 13), transferred from another institution with colonoscopy-proven PMC 14 days after therapy ended, developed diarrhea again and was found to have the toxin A (-), B (+) strain of *C. difficile*. This raised the concern that this strain also may be in the community or other institutions. The same wide range of clinical manifestations observed with *C. difficile* that produces toxin A and toxin B was observed with this unique strain.

It is likely that the CDAD may have been the precipitating event in the two deaths associated with this outbreak. Both cases had serious underlying medical conditions and were profoundly debilitated prior to developing CDAD. *C. difficile*-associated disease carries an overall mortality of 3.4% to 8%⁽⁹⁻¹¹⁾. One of the key factors that discriminates between mortality and survival is length of time from symptoms to treatment. Earlier diagnosis leads to better outcomes⁽⁴⁾. The 18.75% relapse rate we observed was compatible with the 7% to 20% previously documented^(2,3,12). This is presumed to be due to both relapse and re-infection. Up until 10 years prior to this outbreak, the *C. difficile* tissue culture cytotoxicity assay had been used at this institution. A decision had been made at that time to use an EIA that detected only toxin A as most clinically significant isolates have been shown to produce both toxins.

In a recent survey of 380 Canadian hospitals with > 50 beds, it was determined that the tissue culture cytotoxin assay was used in 44.4% of the institutions, EIAs in 38.3%, culture in 32.1%, and latex agglutination in 13.6%⁽¹³⁾. The ultimate assay for *C. difficile* toxin testing has not been developed⁽¹⁴⁾. Tests that detect only toxin A may miss *C. difficile* isolates that produce toxin B but not toxin A. The diagnosis of *C. difficile*-associated diarrhea requires both clinical acumen and supportive evidence from the laboratory. The clinical suspicion of CDAD was high in a number of patients whose EIA for toxin A was negative, thus a *C. difficile* tissue culture cytotoxicity assay was undertaken.

Once the outbreak was identified, infection-control practices and procedures were reviewed and intensified. Although the organism was not isolated from the environment, environmental contamination with *C. difficile* is significant, particularly during outbreaks^(12,15).

The majority of cases were debilitated and had serious underlying conditions, such as hematologic malignancies and renal failure requiring hemodialysis. All cases had received either oral or parenteral antimicrobial therapy prior to the development of CDAD. Three cases had CDAD diagnosed endoscopically because the EIA for toxin A was negative. Twelve cases occurred prior to the initiation of the EIA that detects *C. difficile* toxins A and B. After its introduction, there were four additional cases. Further cases

have not occurred since 30 September 1998. Ongoing surveillance continues.

This preliminary report of an outbreak of toxin A (-), toxin B (+) CDAD highlights the need for and role of appropriate laboratory diagnostic techniques necessary to ensure that outbreaks such as this are not missed. Centres using EIAs that only detect toxin A should be aware that CDAD caused by *C. difficile* that apparently produces only toxin B may occur. When the clinical scenario suggests CDAD but the diagnostic test is negative, it is also important to ensure that alternative diagnostic techniques be available. This outbreak was brought under control by implementing an alternative diagnostic test, and intensifying infection control interventions by focusing specifically on environmental decontamination, education, hand washing, and patient cohorting and isolation. Other authors have suggested that budgetary cuts have led to decreased ward cleaning and ultimately *C. difficile* outbreaks⁽¹⁵⁾. It is unknown whether a similar situation may have contributed in part to this outbreak.

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References

1. Climo MW, Israel DS, Wong ES et al. *Hospital-wide restriction of clindamycin: effect on the incidence of Clostridium difficile-associated diarrhea and cost*. Ann Intern Med 1998;128:989-95.
2. Fekety R, McFarland LV, Surawicz CM et al. *Recurrent Clostridium difficile diarrhea: characteristics and risk factors for patients enrolled in a prospective, randomized, double-blind trial*. Clin Infect Dis 1997;24:324-33.

Editorial Comment

The Canadian Nosocomial Infection Surveillance Program (CNISP) is a collaborative national surveillance program between the Laboratory Center for Disease Control (LCDC), Health Canada, and the Canadian Hospital Epidemiology Committee (CHEC), a subcommittee of the Canadian Infectious Disease Society. In 1997, CNISP conducted a Canadian laboratory-based nosocomial *Clostridium difficile*-associated diarrhea (N-CDAD) surveillance project to determine national sentinel hospital prevalence rates of N-CDAD and to measure morbidity, mortality, and health-care burden. The results of this survey are presently being written for publication.

3. McFarland LV, Surawicz CM, Iubini M et al. *Recurrent Clostridium difficile disease: epidemiology and clinical characteristics*. Infect Control Hosp Epidemiol 1999;20:43-50.
4. Kelly CP, LaMont TJ. *Clostridium difficile infection*. Annu Rev Med 1998;49:375-90.
5. Fekety R. *Guidelines for the diagnosis and management of Clostridium difficile-associated diarrhea and colitis*. Am J Gastroenterol 1997;92:739-50.
6. Wilcox MH, Cuffin JG, Trundle C et al. *Financial burden of hospital-acquired Clostridium difficile infections*. J Hosp Infect 1996;34:23-30.
7. Kofsky P, Rosen L, Reed J et al. *Clostridium difficile - a common and costly colitis*. Dis Colon Rectum 1991;34:244-48.
8. Yablon S, Krotenberg R, Fruhmman K. *Clostridium difficile-related disease: evaluation and prevalence among inpatients with diarrhea in two free standing rehabilitation hospitals*. Arch Phys Med Rehabil 1993;74:9-13.
9. Bradbury AW, Barrett S. *Surgical aspects of Clostridium difficile colitis*. Br J Surg 1997;8:150-59.
10. Jobe BE, Grasley A, Deveny KE et al. *Clostridium difficile colitis: an increasing hospital acquired illness*. Am J Surg 1995;169:480-83.
11. Pendergast TM, Marini CP, D'Angelo AJ et al. *Surgical patients with pseudomembranous colitis: factors affecting prognosis*. Surgery 1994;116:768-74.
12. Gerding DN, Johnson S, Peterson L et al. *Clostridium difficile-associated diarrhea and colitis: SHEA position paper*. Infect Control Hosp Epidemiol 1995;16:459-77.
13. Alfa MJ, Du T, Bada G. *Survey of incidents of Clostridium difficile infection in Canadian hospitals and diagnostic approaches*. Clin Microbiol 1998;36:2076-80.
14. Johnson S, Gerding DN. *Clostridium difficile-associated diarrhea: state of the art clinical article*. Clin Infect Dis 1998;2:1027-36.
15. Jones EM, MacGowan AP. *Back to basics in management of Clostridium difficile infections*. Lancet 1998;352:505-06.

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During the survey period, 13% of the inpatients with diarrhea were identified as N-CDAD with a period prevalence mean of 66.3 cases per 100,000 patient days and 5.9 cases per 1,000 patient admissions. N-CDAD was found most frequently in older patients who had been treated with antibiotics and had been hospitalized for > 2 weeks in medical or surgical wards⁽¹⁾. Forty-one cases died during the surveillance period after being diagnosed with N-CDAD; four were considered to have died directly or indirectly due to N-CDAD. Re-admissions due to N-CDAD in patients previously sent home were 7%, with an average length of stay of

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HEALTH CANADA - SANTÉ CANADA
 Notifiable Diseases Summary (Preliminary) - Sommaire des maladies à déclaration obligatoire (Provisoire)
 New Cases Reported from 1 October - 31 December 1998 - Nouveaux cas déclarés du 1 octobre - 31 décembre 1998

Disease Maladie	ICD-9 CIM-9	Canada [†]			Newfoundland Terre-Neuve			Prince Edward Island Île du Prince-Édouard			Nova Scotia Nouvelle-Écosse			New Brunswick Nouveau-Brunswick			Quebec Québec		
		O-0	Cum.	Cum.	O-0	Cum.	Cum.	O-0	Cum.	Cum.	O-0	Cum.	Cum.	O-0	Cum.	Cum.	O-0	Cum.	Cum.
		0-0	98	97	0-0	98	97	0-0	98	97	0-0	98	97	0-0	98	97	0-0	98	97
AIDS-Sida	042.044	-	105	443	-	1	-	-	2	1	-	5	8	-	1	3	-	37	180
Amoebiasis - Amibiase	006	299	1258	1806	-	-	5	-	-	-	3	22	18	-	-	5	58	208	242
Betulaemia - Botulisme	005.1	-	3	18	-	-	-	-	-	-	-	-	-	-	-	-	-	1	11
Brucellosis - Brucellose	023	2	9	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Campylobacteriosis - Campylobactériose	008.41	2948	12380	13544	40	214	100	8	45	48	39	214	213	58	279	249	788	3081	3447
Chancroid - Chancro mou	009.0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chicamper - Varicelle	052	2178	9221	29587	20	402	589	-	-	-	3	24	334	-	-	-	-	-	-
Chlamydia, genital - Chlamydia génitale	052.1	8231	30245	34144	82	375	335	32	144	138	301	1218	1127	258	859	819	1825	6848	8380
Chlamydia, genital - Chlamydia génitale	052.11*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera - Choléra	001	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheria - Diphthérie	032	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giardiasis - Giardiase	007.1	1373	4483	5877	18	54	42	4	9	5	28	98	92	18	74	133	242	889	899
Gonococcal infections - Infections gonococciques ⁽¹⁾	058	1057	4074	4522	-	2	3	-	1	1	17	84	108	2	17	47	148	483	551
Gonococcal infections - Infections gonococciques	058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gonococcal infections - Infections gonococciques	058.4	2	18	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1
Haemophilus influenzae B (all invasive) - Groupe B à H. influenzae ⁽²⁾	030.0,038.41*	12	50	80	-	-	-	-	-	-	-	-	3	-	-	-	4	17	20
Hepatitis A - Hépatite A	070.0,070.1	188	837	1804	-	2	3	-	1	-	1	8	15	2	5	7	32	181	569
Hepatitis B - Hépatite B	070.2,070.3	444	1702	1581	-	1	3	-	-	-	10	40	28	2	8	8	201	708	455
Hepatitis C - Hépatite C	070.3	4531	18481	19571	5	34	43	8	22	-	87	388	529	47	181	172	482	2403	1880
Hepatitis non-A, non-B - Hépatite non-A, non-B	070.4	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lepidoptera - Léptospirose	042.41	30	84	81	-	-	-	-	1	-	1	4	-	1	3	-	8	20	24
Leprosy - Lèpre	030	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Listeria (all types) - Listérie (tous genres)	027.0,771.22*	18	48	47	-	1	-	-	-	2	-	-	-	-	1	1	-	-	-
Malaria - Paludisme	084	80	294	1029	-	-	-	-	-	-	-	1	1	-	2	1	18	103	158
Measles - Rougeole	055	4	18	584	-	-	8	-	-	-	-	-	2	-	-	4	-	3	4
Meningitis, pneumococcal - Meningite à pneumocoques	320.1	28	59	85	-	-	1	2	2	2	-	-	1	-	-	5	-	-	-
Meningitis, other bacterial - Autres méningites bactériennes ^(2,4)	320.1	12	51	205	1	4	2	-	-	-	1	2	3	2	3	1	-	-	70
Meningitis, viral - Meningite virale ⁽⁴⁾	320.1	204	540	425	1	1	1	-	1	1	-	3	1	-	2	8	32	84	157
Meningitis, viral - Meningite virale ⁽⁴⁾	320.1	33	128	251	2	3	3	-	1	-	2	4	2	-	2	6	10	40	88
Mumps - Oreillons	072	33	110	284	-	-	-	-	-	-	-	2	2	1	2	3	18	25	13
Paratyphoid - Paratyphoïde	002.1-002.8	8	18	14	-	-	-	-	-	-	-	-	-	-	-	-	2	8	3
Paratyphoid - Coqueluche	033	3483	7519	4439	5	40	34	8	21	47	8	48	38	58	234	73	2152	4332	1075
Plague - Peste	020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poliovirus - Poliovirus	045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rabies - Rage	071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubella - Rubéole	056	8	87	4007	1	1	-	-	-	-	-	-	2	-	-	2	-	1	8
Syphilis, congenital - Syphilis congénitale	071.0	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syphilis, congenital - Syphilis congénitale	003	1373	5833	6015	14	183	48	-	29	31	31	177	101	18	133	129	211	1087	1229
Syphilis, congenital - Syphilis congénitale	004	383	1383	1508	2	2	3	-	-	7	2	8	10	1	12	12	38	270	474
Syphilis, congenital - Syphilis congénitale	080	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syphilis, Early Latent - Syphilis, latente récente	082	2	5	40	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2
Syphilis, Early Latent - Syphilis, latente récente	082	28	143	78	-	-	-	-	-	-	2	1	-	-	-	-	-	-	8
Syphilis, Early Latent - Syphilis, latente récente	081	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Syphilis - Autres syphilis	080,082-087	56	218	582	-	-	-	-	-	-	1	7	8	1	5	10	7	28	43
Tetanus - Tétanos	037	-	1	4	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Trichinosis - Trichinose	124	13	32	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Tuberculosis - Tuberculose	010-018	253	850	904	4	8	12	-	-	-	-	3	3	-	-	-	80	223	248
Typhoid - Typhoïde	002.0	8	47	47	-	-	-	-	-	-	-	-	-	-	-	-	1	14	13
Varicella - E. coli - E. coli virulent	008.01*	208	1202	1273	3	7	1	-	11	8	3	73	8	3	33	23	48	342	389
Yellow Fever - Fièvre jaune	080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(1) Includes all 088 categories except 088.4.
 (2) Includes buccal cellulitis or epiglottitis 484.3 in a child < 5 years with no other causative organism isolated.
 (3) Includes encephalitis.
 (4) All other categories except Haemophilus 320.2, Listeria 027.0, Meningococcal 038, Pneumococcal 320.1 and Tuberculosis 013.0.
 (5) All categories except Measles 055, Mumps 072, Poliovirus 045, Rubella 056 and Yellow Fever 080.
 (6) Excludes Typhoid 002.0 and Paratyphoid 002.1 to 002.8.
 * ICD-9 codes used in the list may be incomplete. All 5 digit codes are unofficial and are for LCCOC surveillance purposes only.
 † May not represent national total if data from the provinces are incomplete.

(1) Comprend toutes les rubriques 088, sauf 088.4.
 (2) Comprend cellulite buccale ou épiglottite 484.3 chez un enfant < 5 ans chez qui aucun autre microorganisme causal n'a été isolé.
 (3) Comprend encéphalite.
 (4) Toutes les autres rubriques sauf à Haemophilus 320.2, listériose 027.0, à méningocoques 038, à pneumocoques 320.1 et tuberculose 013.0.
 (5) Toutes les rubriques, sauf rougeole 055, oreillons 072, poliovirus 045, rubéole 056 et fièvre jaune 080.
 (6) Sauf typhoïde 002.0 et paratyphoïde 002.1 à 002.8.
 * Les codes de la CIM-9 figurant dans la liste ne sont peut-être pas complets. Quant aux codes à 5 chiffres, ils ne sont pas officiels, ayant été établis uniquement aux fins de la surveillance du LCCOC.
 † Il se peut que ce chiffre ne représente pas le total national si les données provenant des provinces sont incomplètes.

Notifiable Diseases Summary (Preliminary)(Concluded) - Sommaire des maladies à déclaration obligatoire (Provisoire)(fin)

New Cases Reported from 1 October - 31 December 1998 - Nouveaux cas déclarés du 1 octobre - 31 décembre 1998

Disease Maladie	ICD-9 CIM-9	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia Colombie-Britannique	Yukon	Northwest Territories Territoires du Nord-ouest							
		O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.	O-D O-D	Cum. Cum.
AIDS-Sida	042.044	41	175	5	4	7	1	43	14	43	3	5			
Amoebiasis - Amibiase	006	135	585	9	48	45	8	44	51	21	54	78	89	310	372
Batellum - Batellisme	005.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Brucellosis - Brucellose	023	1	8	2	2	2	4	4	4	4	4	4	4	4	4
Campylobacteriosis - Campylobactériose	008.41*	1031	4330	5253	71	250	227	51	270	207	388	1257	1183	481	2419
Chancroid - Chancro mou	098.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chickpox - Varicelle	052	—	20284	—	—	—	—	—	—	—	—	—	—	—	—
Chlamydia, genital - Chlamydiae génitale	008.81*	2483	9058	10558	773	2854	2587	845	2309	2317	1472	5195	4547	—	4118
Cholera - Choléra	001	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Diphtheria - Diphthérie	032	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gardiasis - Giardiose	007.1	403	1429	2383	55	182	94	58	232	241	287	548	588	253	838
Genitourinary infections - Infections génitourinaires	008	352	1505	1919	88	424	518	71	328	342	183	518	408	138	588
Haemophilus influenzae - Haemophilus influenzae	008.4	2	18	1	—	—	—	—	—	—	—	—	—	—	—
Hepatitis A - Hépatite A	070.0,070.1	55	234	450	2	31	95	14	43	188	32	91	213	48	334
Hepatitis B - Hépatite B	070.2,070.3	18	84	175	3	15	38	8	75	33	38	92	77	185	888
Hepatitis C - Hépatite C	070.2,070.3	1058	4630	8472	—	—	—	201	756	804	1175	2677	1888	1425	5277
Hepatitis non-A, non-B - Hépatite non-A, non-B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Legionnaires - Légionnaires	002.41	8	37	45	—	2	—	—	—	—	12	17	18	—	—
Leprosy - Lèpre	030	—	1	4	—	1	—	—	—	—	—	1	—	—	—
Listeria (all types) - Listeria (tous types)	027.0,771.22	10	33	38	—	—	—	3	8	8	5	8	—	—	—
Listeria (non-group) - Listeria (non-groupe)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malaria - Paludisme	084	19	100	444	—	8	20	2	4	8	14	40	94	7	37
Measles - Rougeole	055	4	9	22	—	—	—	2	23	—	1	245	—	2	275
Meningitis, pneumococcal - Méningite à pneumocoque	320.1	—	24	—	8	11	2	2	8	1	13	22	19	3	11
Meningitis, other bacterial - Méningite à autres bactéries	—	—	8	88	—	5	1	5	7	7	7	28	25	—	—
Meningitis, viral - Méningite virale	—	—	1	187	42	153	28	—	58	8	114	224	41	15	34
Meningitis, other viral - Méningite à autres virus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Meningitis, other - Méningite à autres agents	—	15	48	84	1	8	8	—	1	8	—	14	30	3	5
Mumps - Oreillons	072	4	28	84	1	1	3	—	14	5	4	20	32	5	17
Paratyphoid - Paratyphoïde	002.1,002.9	—	5	5	—	1	2	—	—	—	—	—	—	—	—
Parvovirus - Parvovirus	023	813	1281	1057	58	288	104	83	278	483	358	860	789	100	298
Plague - Peste	020	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poliovirus - Poliovirus	045	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rabies - Rage	071	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rubella - Rubéole	058	1	14	28	1	21	3814	—	—	11	3	27	35	—	3
Scarlet fever - Rubéole érysipéle	771.0	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Salmonellosis - Salmonellose	003	814	2638	2828	42	188	180	47	235	204	245	677	797	147	575
Shigellosis - Shigellose	004	73	326	370	83	232	104	28	111	85	129	238	181	48	158
Syphilis, Congenital - Syphilis, congénitale	080	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Syphilis, Early Latent - Syphilis, latente récente	082	1	3	17	—	—	—	—	—	—	—	—	—	—	—
Syphilis, Early Symptomatic - Syphilis, symptomatique récente	081	4	7	32	—	—	—	—	—	—	—	—	—	—	—
Other Syphilis - Autres syphilis	080,082-087	33	146	422	—	—	—	—	—	—	13	34	40	—	88
Tetanus - Tétanos	037	—	1	2	—	—	—	—	—	—	—	—	—	—	—
Trichinosis - Trichinose	124	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tuberculosis - Tuberculose	010-018	57	231	194	—	—	—	—	—	—	—	—	—	118	345
Typhoid - Typhoïde	002.0	5	28	27	1	2	2	—	—	—	1	3	2	—	—
Verotoxinogenic E. coli - E. coli verotoxinogène	008.01*	57	308	423	18	95	77	8	41	38	45	184	189	22	106
Yellow Fever - Fièvre jaune	080	—	—	—	—	—	—	—	—	—	—	—	—	—	—

SYMBOLS

.. Not reportable
.. Not available
.. No cases reported

SIGNES

.. À déclaration non obligatoire
.. Non disponible
.. Aucun cas déclarés

SOURCE:

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Laboratory Centre for Disease Control
Health Canada
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SOURCE:

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Laboratoire de lutte contre la maladie
Santé Canada
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13.6 days. The costs of re-admissions alone for N-CDAD per year per site were estimated at \$128,200⁽²⁾.

As reported in the above outbreak, CDAD is a serious problem within hospitals. Appropriate laboratory diagnostic techniques, early diagnosis, stringent antibiotic use, and infection-control practices are the necessary components to control the occurrence and spread of CDAD. Hospital laboratories and health-care workers need to be aware of the potential misdiagnosis or underreporting of CDAD. Additional surveillance and research is needed to identify the changing etiology of this condition.

References

1. Hyland MJ, Ofner-Agostini M, Paton S et al. *Nosocomial Clostridium difficile-associated diarrhea (N-CDAD) in Canada – the results of the Canadian Nosocomial Infection Surveillance Program (CNISP) 1997 N-CDAD Prevalence Surveillance Project*. Can J Infect Control 1998;13:Abstracts 15.
2. Miller M, Hyland MJ, Ofner M et al. *Morbidity, mortality, and health-care burden of nosocomial Clostridium difficile-associated diarrhea (N-CDAD) in Canadian hospitals*. Infect Control Hosp Epidemiol 1998;19:691. Abstract 65.

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